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## **Do testimonies of traumatic events differ depending on the interviewer?**

Brönnimann, Rebecca ; Herlihy, Jane ; Müller, Julia ; Ehlert, Ulrike

**Abstract:** While differences in witness narratives due to different interviewers may have implications for their credibility in court, this study considers how investigative interviews by different parties to the proceedings, as well as the gender and nationality of interviewers, can influence the testimony of witnesses in court who share comparable traumatic experiences. The foundation of the analysis was answers given to judges, prosecutors, civil party lawyers and defence lawyers in the Extraordinary Chambers in the Courts of Cambodia (ECCC) located in Phnom Penh. Transcribed testimonies of 24 victim witnesses and civil parties which were translated from Khmer into English were analysed using a computer-based text analysis program, the Linguistic Inquiry and Word Count (LIWC). Results showed that when answering questions by females, witnesses used significantly more cognitive process words. When interviewed by international rather than by Cambodian parties to the proceeding witness accounts were composed of significantly more verbal expressions of affective processes and of perceptual processes. Furthermore, witnesses used most cognitive and affective process words during the interview by civil party lawyers and defence lawyers. These results may be due to a prior supportive relationship between civil parties and their lawyers and due to a more interrogative question style by the defence lawyers, who attempt to undermine the credibility of the interviewed witnesses. Data shows that LIWC analysis is an appropriate method to examine witness accounts and, therefore, contributes to a better understanding of the complex relationship between testimony in events under litigation and credibility.

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## DO TESTIMONIES OF TRAUMATIC EVENTS DIFFER DEPENDING ON THE INTERVIEWER?

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### Abstract

While differences in witness narratives due to different interviewers may have implications for their credibility in court, this study considers how investigative interviews by different parties to the proceedings, as well as the gender and nationality of interviewers, can influence the testimony of witnesses in court who share comparable traumatic experiences. The foundation of the analysis was answers given to judges, prosecutors, civil party lawyers and defence lawyers in the Extraordinary Chambers in the Courts of Cambodia (ECCC) located in Phnom Penh. Transcribed testimonies of 24 victim witnesses and civil parties which were translated from Khmer into English were analysed using a computer-based text analysis program, the Linguistic Inquiry and Word Count (LIWC). Results showed that when answering questions by females, witnesses used significantly more cognitive process words. When interviewed by international rather than by Cambodian parties to the proceeding witness accounts were composed of significantly more verbal expressions of affective processes and of perceptual processes. Furthermore, witnesses used most cognitive and affective process words during the interview by civil party lawyers and defence lawyers. These results may be due to a prior supportive relationship between civil parties and their lawyers and due to a more interrogative question style by the defence lawyers, who attempt to undermine the credibility of the interviewed witnesses. Data shows that LIWC analysis is an appropriate method to examine witness accounts and, therefore, contributes to a better understanding of the complex relationship between testimony in events under litigation and credibility.

**Keywords:** legal interview; interviewer characteristics; variability in witness accounts; Linguistic Inquiry and Word Count (LIWC), traumatic event.

### Resumen

Sobre la base de que las diferencias en los relatos de testigos debidas al papel de los entrevistadores pueden tener consecuencias para la credibilidad ante la Sala de Justicia, se planteó un estudio con el objeto de abordar cómo las entrevistas investigativas de las partes implicadas en el procedimiento, así como el género y nacionalidad de los entrevistadores, pueden influir el testimonio de testigos que compartieron experiencias traumáticas similares. Como objeto de estudio se tomaron las repuestas dadas a jueces, fiscales, y abogados de la acusación particular y defensa, Cámara Extraordinaria de las Cortes de Camboya (CECC) en Phnom Penh. Las transcripciones del testimonio de 24 víctimas y civiles, traducidas al Inglés del Jemer, fueron analizadas con el programa Linguistic Inquiry and Word Count (LIWC). Los resultados mostraron que al responder a las preguntas de operadores jurídicos femeninos, los testigos utilizaban significativamente más palabras del procesamiento cognitivo. Al ser entrevistados por las partes internacionales y no por las camboyanas, las declaraciones de los testigos en el procedimiento contenían significativamente más expresiones verbales de los procesos afectivos y perceptuales. Además, los testigos utilizaban más palabras de procesamiento cognitivo y afectivo cuando eran entrevistados por los abogados de la defensa y la acusación particular. Estos resultados pueden deberse a una anterior relación de apoyo entre los abogados, y a un estilo, por parte de los abogados defensores de preguntas más interrogativo, con el que intentaría socavar la credibilidad de los testigos. Los resultados avalan al análisis LIWC como método apropiado para examinar los relatos de testigos y, por extensión, a contribuir a una mejor comprensión de la compleja relación del testimonio en condiciones de litigio con la credibilidad.

**Palabras clave:** entrevista judicial; características del entrevistador; variabilidad en el testimonio; Linguistic Inquiry and Word Count (LIWC); evento traumático.

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## Introduction

Witnessing crime events may be traumatic and confusing and speaking with legal professionals can be very intimidating. A combination of interviewer behaviour that does not help to promote accurate fact-finding and witness vulnerability may bias witness accounts. Witnesses can change answers that they would not have changed if interviewed in a neutral manner (McGroarty & Baxter, 2007). When witnesses change their answers due to the interviewer asking style and behaviour, an increased variability in witness answers can occur and may result in an appearance of untrustworthy testimony. In the legal context, inconsistencies of interviewees' responses are strongly associated with a decreased credibility (Berman, Narby, & Cutler, 1995). To be believed, witnesses, no matter what their background or emotional state, must present themselves and their experiences appropriately to the authorities. In for example refugee law, credibility strongly relies on the ability of the witnesses to remember and communicate coherently and consistently in court about the horrific experiences they suffered (Herlihy & Turner 2009).

Since inconsistency in disclosure has implications for credibility, variability in witness accounts due to question style, behaviour, and social and psychological attributes of the interviewer become important. However, little attention has been paid so far to variability in witnesses' accounts in relation to different interviewers. Since alleged victims are often the only available sources of information about their experiences, professionals have made extensive efforts to understand how the accuracy of testimony might be evaluated and maximized. Most of this research has been conducted in laboratory analogue contexts, where researchers can stage events and thus know exactly what actually happened to the interviewees. However, the ecological validity of such research has to be questioned (Orbach & Lamb 2001). To allow ecologically valid statements about how the interviews of different judicial parties influence witness testimonies (and therefore may compromise witness credibility), a court setting from the field is required, in which witnesses are homogeneous and can be compared, since a range of witness characteristics, for instance, age, race, stereotypes, and whether the witness is also a victim of the crime (Kapardis, 2010), influences witness accounts. Furthermore, the same witnesses have to be interviewed by different parties to the proceedings and may be sensitive to the questions of the interviewer.

For this reason, it was decided to examine testimonies of witnesses who gave accounts at the first trial in the Extraordinary Chambers in the Courts of Cambodia (ECCC), since they could be seen as a comparable group of witnesses. They share a common cultural heritage, speak the same language and testified in the same court in similar circumstances. Witnesses recounted their firsthand highly traumatizing experiences during the period of Democratic Kampuchea. Several studies have found high rates of posttraumatic stress disorder (PTSD) among Cambodians, of between 11.2% (Sonis et al., 2009) and 28.4% (De Jong et al., 2001). In a group of Cambodian refugees, high levels of association between traumatic experiences and the severity of both traumatic stress and dissociative reactions were found (Carlson & Rosser-Hogan, 1991), suggesting that traumatized Cambodians may be more vulnerable to interrogative suggestibility than other witnesses of more trivial events (see also Drake, Bull, & Boon, 2008; Merckelbach, Murris, Rassin, & Horselenberg, 2000). Furthermore, it can be assumed that traumatized witnesses may respond with a particular sensitivity to questions of the interviewer due to a heightened sense of ongoing threat (Ehlers & Clark 2000). The chosen sample of witnesses could, therefore, be described as a homogeneous vulnerable witness group, particularly vulnerable to the stresses of open court questioning, and are therefore especially well-suited for investigating the effects of interview style on witness accounts in court. Analyzing how witness testimonies are influenced by different interviewers is also facilitated at the ECCC, because many different interviewers were involved (see method section). Interviewers differ in terms of their profession, gender, and nationality. The court includes both Cambodian and non-Cambodian – known as international personnel. Most of the international personnel are from industrialised, Western-culture nations. Furthermore, at the ECCC, investigative interviewers of both genders were employed.

The task of the ECCC is to try senior members of the Khmer Rouge for war crimes committed between 1975 and 1979. The ECCC was created through an agreement between the Government of the Kingdom of Cambodia and the United Nations. It is described as a hybrid court while the ECCC features both Cambodian staff and judges together with foreign personnel and both domestic and international law is applied. Since the ECCC is procedurally closely modelled on the French civil law system, the Court adopted a predominantly inquisitorial approach. In the inquisitorial system, judges are not passive recipients of information but play a more active role in controlling the course of proceedings. They actively steer the search for evidence and

are empowered to put questions to the witnesses. At the ECCC, the judges of the Trial Chamber call witnesses, whose responses are deemed useful in the revelation of the truth and primarily lead the evidence in the case (Staggs-Kelsall et al., 2009). As part of the ECCC process, many survivors of the war crimes committed by the Khmer Rouge between 1975 and 1979 provided testimony at the public hearing. The victims of the Khmer Rouge regime participate either as fact witnesses or as civil parties. The latter are legally represented by lawyers and participate in supporting the prosecution (Werner & Rudy, 2010). The Trial Chamber hears testimony on the basis of a common witness list that the court created after receiving suggestions from all parties to the hearings. The statutory provisions and recent practice indicate that the judges question the witnesses first, followed by the co-prosecutors, the civil party lawyers, and, finally, by the defence lawyers (Petit & Ahmed, 2010).

The novelty in this approach is the focus on witness testimonies in relation to interviewers of different parties to the proceedings. It was hypothesized (1) that the narrative accounts that witnesses construct will differ on a cognitive, emotional, and perceptual level depending on the questions of different law-enforcement personnel (judges, prosecutors, civil party lawyers, defence lawyers). Witnesses are not allowed to tell their experiences in their own words but are forced into a co-construction with the interviewer (Eades, 2008). Through the act of questioning, the examiner thus controls the form the discourse takes, and ultimately the structure of the information transfer in the court situation (Harris, 1984). In practice, it is not always the intention to interview witnesses in a manner that maximizes their chances of providing accurate testimony. Defence lawyers conducting cross-examination, for example, may ask more credibility-challenging questions than prosecutors (e.g., Hobbs 2003; Kassin, Williams, & Saunders, 1990). Biased interviewers attempt to elicit from witnesses, accounts that support the interviewers' contention about what happened (Bruck, Ceci, & Hembrooke, 1998). To this end, interviewers may press witnesses through suggestive questioning methods to elicit a certain description rather than witnesses' actual experiences. According to their own agenda, interviewers of different parties to the proceedings may therefore differ in their questioning and behaviour towards the witnesses, which in turn leads to differences in witness accounts.

It was assumed that witnesses would feel most at ease talking when interviewed by their own lawyer. A trusting relationship breaks down resistance (Fisher, 1995). Most clinicians and researchers agree that the more at ease the interviewee feels in the

interview setting, the more information the person is likely to impart (Powell, Fisher, & Wright, 2005). This is especially true when the topic is sensitive or traumatic or the interviewee is anxious and fearful about the possible consequences if, for example, they are disclosing something which they know or fear to be an offence. A clear parallel can be drawn to the therapeutic relationship in psychotherapy. An active, affective therapeutic relationship is needed to create a safe, interactive environment that promotes disclosure of traumatic experiences. A trusting relationship provides the context necessary for accessing, reworking and integrating the traumatic material (Olio & Cornell, 1993). Therefore, in the interview situation with their own lawyer, witnesses should impart the most personal information (Powell et al., 2005) and they should draw most attention to themselves and their emotions compared to conversations with other interviewers. Therefore, it was expected that witnesses (hypothesis 2) would use more emotional, cognitive and perceptual process words when interviewed by their own lawyers than when interviewed by other parties to the proceedings. Furthermore, it was expected that during interviews by defence lawyers, witnesses would feel most stressed. A stressful interviewing style with a disbelieving stance is likely to decrease the likelihood of a full disclosure. Stress is thought to decrease attention, to reduce motivation and to interfere with efficient recall (Saywitz & Nathanson, 1993). Thus witnesses should show decreased attention and should distance themselves from personal trauma. This would be reflected in the use of a lower number of emotional, cognitive, and perceptual process words, when compared to testimony given to other parties to the proceedings (hypothesis 3).

Answers given to questions from female interviewers were expected to be different from the ones given to male interviewers. In an analysis of 14000 heterogeneous written and oral samples, Newman, Groom, Handelman and Pennebaker (2008) showed that women use more words related to psychological and social processes than men. In particular, the authors found women to use more cognitive, emotional, and perceptual process words than men. In a linguistic study, Niederhoffer and Pennebaker (2002) were able to demonstrate a linguistic style-matching in dyadic interactions. They found that the words one speaker used primed the listener to respond in a specific way. Following the finding of these studies, it can be expected that witnesses will use more cognitive, emotional, and perceptual process words when interviewed by women than when interviewed by men (hypothesis 4).



Finally, testimonies given in response to Cambodian interviewers were expected to be different from testimony to non-Cambodian international interviewers. Given that emotion is less expressed in Cambodia than in the western world (Cheung, 1993), one can expect that Cambodian legal professionals may refrain from asking about emotions and affective states whereas international law personnel would not. Again, considering style matching, it can be hypothesized that the Cambodian witnesses will use more emotional process words when interviewed by international parties than when speaking with people with whom they share a culture less inclined to publically express emotion (hypothesis 5).

To summarize, systematic features of testimonies depending on the occupation, gender, and nationality of the interviewers were examined. Specifically: Do witnesses differ in their testimonies depending on the interviewing parties to the proceedings? Are answers given to questions of female interviewers different from answers given to male interviewers? Does the nationality of interviewers influence testimony?

To answer these questions, witness accounts given to the different parties to the proceedings, to female and male interviewers and to Cambodian and foreign interviewers, were separated into individual text files and processed with a computer-based text analysis program, the Linguistic Inquiry and Word Count (LIWC). Percentage values in the categories of interest (cognitive, emotional, and perceptual processes) were then compared. The following hypotheses were tested:

- (1) Testimonies achieved by judges (TJ), by prosecutors (TP), by civil party lawyers (TC) and testimonies achieved by defence lawyers (TD) will significantly differ from each other in the number of cognitive, emotional, and perceptual process words used.
- (2) Witnesses will use more emotional, cognitive, and perceptual process words when interviewed by their own civil party lawyers than when interviewed by other parties to the proceedings.
- (3) Witnesses will use a lower number of emotional, cognitive, and perceptual process words in their answers given to defence lawyers, when compared to testimony given to other parties to the proceedings.
- (4) Answers given to questions from female interviewers will be significantly different from the ones given to male interviewers, contain more emotional, cognitive, and perceptual process words than in the answers given to male interviewers.

- (5) Testimony given in response to Cambodian interviewers will have fewer emotional process words than in testimony given to non-Cambodian international interviewers.

## **Method**

### **Protocols**

Data were obtained from court trials dealing with atrocities committed during the period of Democratic Kampuchea. The case against Kaing Guek Eav, alias “Duch”, who was head of Security Prison 21 (S-21, Tuol Sleng), spanned a total of 77 days. It started on March 30, 2009, following an initial hearing on February 17, 2009. Substantive hearings came to an end on September 17, and closing submissions in the Duch case were heard from November 23 to 27, 2009. During this time the ECCC heard a total of 47 witnesses (comprising 38 witnesses of fact and 9 expert witnesses) and 22 civil parties. Transcripts of witness testimonies were collected from the [cambodiatribunal.org](http://cambodiatribunal.org) website. Transcripts are translated into English, although witnesses testified in their mother tongue, Khmer. The English translations of Khmer testimonies are therefore the foundation of the analysis (for a commentary on the translation process, please look at the discussion section). Testimonies of expert witnesses and witnesses of fact whose affidavits were read into the record have not been included in the analysis. Also excluded from evaluation were the testimonies of civil parties, who gave their evidence (concerning damage and injury suffered from the crimes allegedly committed by the accused) beginning on August 7, 2010 and later, because most of them were not interviewed by all the relevant parties to the proceedings. Overall, accounts of 24 witnesses of fact and civil parties were examined.

### **Procedure and design**

Transcripts of court proceedings were copied into Microsoft Word files in order to process them with the LIWC (Pennebaker, Booth, & Francis, 2007). LIWC is a computerized text analysis program that categorizes and quantifies word use. It counts the percentage of a text's sample words which fall into a given predefined category. Because LIWC results are presented in terms of percentages rather than as raw counts, texts samples can be compared against each another, even if the length of each of them varies. Witness statements were first separated by answers to questions of interviewers

from the four parties to the proceedings into individual text files. Because the four parties to the proceedings consisted of a total of 26 interviewers, more than one speech sample per witness could be obtained for one party to the proceeding (e.g., up to five speech samples per witness when interviewed by all of the five judges asking questions at the ECCC). Thirteen speech samples contained fewer than 100 words and were therefore excluded from analysis because Pennebaker (2001) suggested a minimum of 100 words for LIWC analysis. This resulted in a total of 214 speech samples of testimonies given to selected interviewers from the different parties to the proceedings. Processed LIWC results in linguistic categories of interests then were statistically averaged in order to obtain one percentage value for each witness in one predefined LIWC category for answers to one party to the proceeding. This resulted in four percentage values for every single witness in one linguistic category in interviews to the four parties.

In a second step witness statements were separated by answers to questions of male and female interviewers into individual text files. One speech sample per witness could be obtained for each female and for each male interviewer. Again the processed LIWC results in linguistic categories of interest were statistically averaged to get two percentage values for each witness in each LIWC category of interest for answers to male and female interviewers. The same procedure than was applied for answers to questions of Cambodian and international law enforcement personnel. Analyses undertaken in this study therefore relied on three different data sets.

To control for the gender and the nationality of different interviewers a repeated measure ANOVA test relying on only one data set should have actually been applied. Within-subjects factors in the analysis should have been party to the proceeding (4 levels), nationality (2 levels) and gender (2 levels) of interviewers. This would have resulted in a repeated measure ANOVA design with 16 measurements (4x2x2). However, due to the naturalistic data resulting from this field study a lot of missing values had to be taken into account. At the ECCC there are for example no female Cambodian judges, no female prosecutors and no female Cambodian defence lawyers. Therefore no data was available for 4 measurements and a repeated measure ANOVA design with 16 measurements could not be applied. As a result, it was not feasible to directly control the effects of the interviewer in the witness accounts. Thus, different interviewers were taken in each condition to counterbalance their effects in obtained testimonies.

Although trial proceedings were public and transcripts of witness testimonies are accessible for everyone online, all names in our data are anonymized. The 24 examined witnesses were on average 57 years old. Out of the 24 witnesses, three were female and 21 were male and 23 witnesses have Cambodian citizenship, while one person has not but had lived in Cambodia. Seven witnesses gave their evidence as civil parties, whereas the remaining 17 witnesses testified as fact witnesses in open court. Of the legal persons asking questions to the 24 witnesses, there were three Cambodian and two international judges (the Trial Chamber), three Cambodian and five international prosecutors, five Cambodian and five international civil party lawyers, as well as one Cambodian and two international defence lawyers, resulting in 26 interviewers. Six of these interviewers were female and 20 were male.

### **Content analysis**

Witness testimonies were analysed from a linguistic perspective with an innovative computerized content analytic approach, the Linguistic Inquiry and Word Count (LIWC). LIWC is a transparent text analysis program that categorizes and quantifies language use and scores words and word stems to psychologically meaningful categories (Tausczik & Pennebaker, 2010). In LIWC, words are the unit of analysis. It counts the frequency of words (percentage of all recognized words) in 80 predefined categories, including linguistic processes (e.g., articles, prepositions), psychological processes (e.g., emotional, cognitive, and perceptual processes), words denoting relativity (e.g., time, space), and personal concerns (e.g., religion, work). Over 86% of the words people use in spoken and written comments can be captured by the LIWC2007 Dictionary (Pennebaker, Booth, & Francis, 2007), the newest version available and the one used in this study. The dictionary consists of almost 4500 words and word stems. Across categories several language dimensions are straight forward, meaning that they are objective and based on grammatical rules. For example, the category of articles consists of three words: “a”, “an”, and “the”. Other more subjective dimensions (e.g., words in the psychological processes and personal concerns categories) are based on a multistep rating procedure involving several trained raters (for details of this procedure, see Pennebaker, Chung, Ireland, Gonzales, & Booth, 2007). Most of the categories are arranged hierarchically. The word “rage”, for example, is sorted into the grand category of emotional process as well as into the subcategory of negative emotion words. The LIWC is especially well-suited to examine

differences in witness testimonies varying with different interviewers, because it can analyze voluminous quantities of transcribed verbal text in a very swift and economic manner.

The LIWC word categories have adequate psychometric properties (Pennebaker, Chung et al., 2007) and the use of the LIWC to measure psychological processes has increased in the past few years (Kahn, Tobin, Massey, & Anderson, 2007). Furthermore, the assumed analogy of different languages if it comes to the language style as assessed by the LIWC has been proven empirically several times (Ramirez-Esparza, Pennebaker, Garcia, & Suria, 2007; Wolf, Horn, Mehl, Haug, Pennebaker, & Kordy, 2008; Zijlstra, van Meerveld, van Middendorp, Pennebaker, & Geenen, 2004). In the current study using the LIWC program (Pennebaker, Booth, & Francis, 2007), four aspects of linguistic content and structure were analyzed: psychological processes including sensory processes (referred to in the LIWC program as perceptual processes), affective processes, cognitive processes, and word count. Only in the main linguistic categories (emotional, cognitive, and perceptual process words) where significant differences between groups were found, were analyses calculated for the subcategories as well. For the main category cognitive process words only the insight and causation subcategories were examined, several studies have suggested to play a role in the disclosure of trauma-relevant topics (e.g., Pennebaker, Mayne, & Francis, 1997). Table 1 lists categories and subcategories with examples of each one.

**Table 1.** LIWC2007 Content Categories of Affective, Cognitive and Perceptual Processes, with Subcategories, Abbreviation and Examples (Pennebaker, Booth, & Francis, 2007).

Category	Abbreviation	Examples
<b>Affective processes</b>	affect	Happy, cried, abandon
Positive emotion	posemo	Love, nice, sweet
Negative emotion	negemo	Hurt, ugly, nasty
Anxiety	anx	Worried, fearful, nervous
Anger	anger	Hate, kill, annoyed
Sadness	sad	Crying, grief, sad
<b>Cognitive processes</b>	cognitive	Cause, know, ought
Insight	insight	Think, know, consider
Causation	cause	Because, effect, hence
<b>Perceptual processes</b>	percept	Observing, heard, feeling
See	see	View, saw, seen
Hear	hear	Listen, hearing
Feel	feel	Feels, touch

### Data analysis

Linguistic data of witnesses' translated answers given during interviews by different law-enforcement personnel, who were within the same professional group, were statistically averaged. Normal distribution and homogeneity of variance were tested using a Kolmogorov-Smirnov and Mauchly's sphericity test. All reported results were corrected by the Greenhouse-Geisser procedure, where appropriate (violation of sphericity assumption) (Greenhouse & Junker 1992). To control for differences due to questions of different interviewers in emotional, cognitive and perceptual processes, three analyses of variance (ANOVAs) for repeated measures were computed. Statements of the same witnesses were compared in four conditions: statements following questions by judges, prosecutors, civil party lawyers, and defence lawyers. Differences in dependent linguistic variables of interest that were not normally distributed were analysed with nonparametric Friedman ANOVA tests. After the main linguistic categories (emotional, cognitive, and perceptual process words) were analyzed, where significant differences between groups were found, analysis of variance (ANOVAs) for repeated measures or nonparametric Friedman ANOVA were calculated for selected subcategories. Follow-up tests, where overall effects from Friedman ANOVA were significant, were performed with the Wilcoxon signed-rank tests and two-tailed t-tests in cases where overall effects from analysis of variance (ANOVA)

were significant. Although there is a priori expectation about directionality, two-tailed t-tests were conducted in order to satisfy a more conservative approach to statistical significance. Pairwise post hoc comparisons were conducted by means of t-tests and Wilcoxon signed-rank test. To protect against a Type I error, a Bonferroni correction was used. Paired sample t-tests and Wilcoxon signed-rank tests were accepted as significant only if their significance was less than  $\alpha/6$ , on adjustment for the number of analyses meaning they had a p value less than .0083.

To compare witness statements depending on gender and nationality of law enforcement personnel, dependent t-tests were executed. Results were considered statistically significant at the  $p \leq .05$  level, and all tests were two-tailed. In the case of single missing data, cases were excluded listwise, meaning that if a witness was not interviewed by one party, the linguistic data of the witness answers given to other parties to the proceedings were excluded from analysis as well.

Effect size measures were calculated only for focused comparisons (Field, 2009). Effect size magnitudes have been interpreted based on rules of thumb suggested by Cohen (1988), whereby an effect size of  $r = .10$  is considered as small;  $r = .30$  is considered as medium; and  $r = .50$  is considered as large.

## Results

### Witnesses responses to different parties to the proceedings

Due to the fact that one witness was not interviewed by the prosecution and another witness was not interviewed by the defence lawyers, the testimonies of two witnesses were excluded. Therefore speech samples from 22 witnesses were analyzed, of whom three were female and 19 male. All of the 22 witnesses underwent four conditions in the exact same order: Interview by judges, by prosecutors, by civil party lawyers, and by defence lawyers. The sample consists of six civil parties and 16 fact witnesses.

Statements to judges, prosecutors, civil party lawyers, and defence lawyers differed in terms of their total word count. In the examined main categories (see Table 2), significant differences were found for affective processes, cognitive processes, and perceptual processes over the four conditions. Furthermore, significant differences were found in the emotion subcategory negative emotion,  $\chi^2(3, N = 22) = 10.40, p = .014$ , in anxiety,  $\chi^2(3, N = 22) = 9.23, p = .024$ , and in anger,  $\chi^2(3, N = 22) = 9.15, p = .021$ , in

the cognitive process subcategories insight,  $F(3, 63) = 4.222, p = .009$ , and causation,  $F(3, 63) = 5.67, p = .002$ , as well as in the perception subcategory feel,  $\chi^2(3, N = 22) = 13.69, p = .003$ .

### **Word Count**

Answers to judges, prosecutors, civil party lawyers, and defence lawyers differed in terms of actual word count. When interviewed by judges, testimonies composed of a significantly higher number of words compared to TP, TC and TD.

### **Affective process words**

Testimonies containing affective process words significantly differed in relation to the interviewer roles. Most affective words were used during interview by defence lawyers. Post hoc analysis showed significant differences between TJ and TC,  $Z = -3.49, p < .001, r = -.526$ , as well as between TJ and TD,  $Z = -2.78, p = .004, r = -.418$ . Over the four interviewer roles, significant differences in witness statements were found for negative emotion words. Most negative emotion words and most anger words were used during interview with defence lawyers, whereas testimonies during interview by civil party lawyers contained most words related to anxiety. Post hoc analysis showed significant differences for the category negative emotion words between TJ and TC,  $Z = -3.30, p < .001, r = -.497$ , as well as for the subcategory anxiety between TJ and TC,  $Z = -2.68, p = .006, r = -.404$ . According to Cohen (1988) the  $r$ 's found within the affective process words category can be interpreted as large effect sizes.

### **Cognitive process words**

Most cognitive process words were used when witnesses were interviewed by civil party lawyers. Different findings applied for the subcategories insight and causation, where most words were used by the interviewees of the defence lawyers. Post hoc test showed significant differences in cognitive process words between TJ and TC,  $Z = -3.39, p < .001, r = -.512$ , and between TJ and TD,  $Z = -3.52, p < .001, r = -.531$ , as well as between TP and TC,  $Z = -2.711, p = .005, r = -.409$ . Post hoc tests further revealed differences in the subcategory causation between TJ and TC,  $t(21) = -3.45, p = .002, r = .601$ , and between TJ and TD,  $t(21) = -3.15, p = .005, r = .567$ , as well as in the subcategory insight between TJ and TD,  $t(21) = -3.62, p = .002, r = .620$ . According to Cohen (1988) the  $r$ 's found within the cognitive process words category can be interpreted as large effect sizes.



### Perceptual process words

Witness testimonies during interview by civil party lawyers contained most perceptual process words. Post hoc differences in the use of perceptual process words were found between TC and TD,  $Z = -2.58$ ,  $p = .008$ ,  $r = -.389$ , and differences in the use of words related to feeling, a subcategory of perceptual processes, were detected between TC and TJ,  $Z = -2.60$ ,  $p = .008$ ,  $r = -.392$ , as well as between TC and TD,  $Z = -3.17$ ,  $p = .001$ ,  $r = -.478$ . According to Cohen (1988) the  $r$ 's found within the perceptual process words category can be interpreted as large effect sizes.

**Table 2.** Testimonies Achieved by Different Interviewers.

	<b>TJ</b> <i>M(SD)</i>	<b>TP</b> <i>M(SD)</i>	<b>TC</b> <i>M(SD)</i>	<b>TD</b> <i>M(SD)</i>	$\chi^2/F$
<b>Word count</b>	2185.07 (1204.37)	550.43 (325.75)	498.51 (206.46)	542.07 (344.14)	$\chi^2(3)=35.291***$
<b>Affect</b>	2.00(0.83)	2.48(1.19)	2.79(0.73)	3.00(1.63)	$\chi^2(3)=13.036**$
<b>Negemo</b>	0.98(0.34)	1.44(0.94)	1.46(0.54)	1.58(1.16)	$\chi^2(3)=10.397*$
<b>Anx</b>	0.15 (0.17)	0.20(0.17)	0.26(0.22)	0.20(0.49)	$\chi^2(3)=9.230*$
<b>Anger</b>	0.39 (0.17)	0.63(.61)	0.57(0.34)	0.89(1.07)	$\chi^2(3)=9.152*$
<b>Cognitive</b>	16.84 (1.28)	18.42(2.63)	19.78(2.84)	19.68(3.44)	$\chi^2(3)=18.873***$
<b>Insight</b>	2.23 (0.63)	2.59(1.13)	2.86(1.20)	3.15(1.15)	$F(3, 63)=4.222**$
<b>Cause</b>	1.39 (0.36)	1.36(0.79)	1.77(0.44)	1.85(0.72)	$F(3, 63)=5.674**$
<b>Percept</b>	1.66 (0.69)	2.14(1.33)	2.18(0.90)	1.73(0.79)	$\chi^2(3)=8.394*$
<b>Feel</b>	0.19 (0.14)	0.21(0.22)	0.37(0.32)	0.14(0.20)	$\chi^2(3)=13.688**$

*Note.* TJ = testimonies achieved by judges; TP = testimonies achieved by prosecutors; TC = testimonies achieved by civil party lawyers; TD = testimonies achieved by defence. Dependent variable = percentage of words. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$  (two tailed).

### Testimonies and gender of interviewers

One witness was exclusively interviewed by male interviewers. Therefore, the analyzed sample consists of 23 witnesses. Of the 26 persons who interviewed these 23 witnesses, 6 are women and 20 are men.

Statistically significant differences in the main LIWC-categories were found for overall word count and cognitive processes. When answering questions by females, witnesses generally used fewer words,  $t(22) = 6.709$ ,  $p < .001$ ,  $r = .820$ , but more cognitive process words,  $t(22) = -4.981$ ,  $p < .001$ ,  $r = .728$ , and they showed a higher mean in the subcategory insight,  $t(22) = -3.04$ ,  $p = .006$ ,  $r = .544$ . According to Cohen

(1988) the calculated  $r$ 's found for differences between testimonies achieved by females and by males can be interpreted as large effect sizes.

### **Testimonies and nationality of interviewers**

All examined witnesses were interviewed by both national and international parties to the proceedings. The sample used in this analysis therefore consists of 24 witnesses.

Answers to Cambodian law enforcement personnel were longer,  $t(23) = 2.518$ ,  $p = .019$ ,  $r = .464$ . However, witness testimonies were composed of significantly more verbal expressions of affective processes,  $t(23) = -3.098$ ,  $p = .005$ ,  $r = .543$ , as well as of perceptual processes,  $Z = -2.429$ ,  $p = .015$ ,  $r = -.351$  when interviewed by international parties to the proceeding. In the subcategories of the affective process words, significant differences were found for positive emotions,  $Z = -2.49$ ,  $p = .012$ ,  $r = -.367$ , as well as for anxiety,  $t(23) = -2.67$ ,  $p = .014$ ,  $r = .236$ , indicating that witnesses referred less to positive emotions and anxiety when interviewed by national law enforcement personnel. In the subcategories of the perceptual process words, significant differences were found for the subcategory hear,  $Z = -2.89$ ,  $p = .003$ ,  $r = -.417$ . Witnesses referred more to hearing when interviewed by international law enforcement personnel. According to Cohen (1988) the calculated  $r$ 's found for differences between testimonies achieved by international and by national parties to the proceedings can be interpreted as medium to large effect sizes.

### **Discussion**

Consistent with the hypotheses 1, 2, and 3, differences in witness testimonies were related to different parties to the proceedings as well as to the gender (hypothesis 4) and nationality of the interviewers (hypothesis 5). Linguistic style differences in witness testimonies varied with the interviewing parties to the proceeding and were found in verbal expression of affective, cognitive, and perceptual processes and in terms of actual word count. Main differences in testimonies were found between interviews by judges and civil party lawyers, and between interviews by judges and defence lawyers. When interviewed by civil party lawyers, witnesses verbally expressed more emotions, in particular, more negative emotion such as anxiety, more cognitive process such as causation words, and more perceptual process words such as *feel*, relative to when they

were interviewed by judges. Contrary to our expectation for hypothesis 3, in answers to defence lawyers, an increased use of affective process words, as well as an increased use of cognitive process words (more insight and causation words) could be found compared to the answers given to judges. When answering questions of females, witness generally used more cognitive process words, compared to when answering questions of males. Furthermore, witness testimonies were composed of significantly more verbal expression of affective and perceptual processes when interviewed by international parties to the proceeding in comparison to interview by Cambodian legal professionals.

Differences in word count in answers given to legal professionals first and foremost reflect the different allocated time slots for each party to interview witness. Prosecutors were allowed to ask witness questions for 15, 30, 45, and 60 minutes, respectively, depending on the length of overall witness account. Civil party groups and defence had a limited amount of time to interview- also 20, 40, 60, or 80 minutes. No time allocation was defined for interview by judges. When interviewed by judges, witness testimonies were composed of almost four times more words than when interviewed by prosecutors, civil party lawyers or defence lawyers. Although civil party lawyers and defence lawyers had a bit more time available than prosecutors to interview witnesses, witness testimonies did not differ concerning their length over these interviews. In the LIWC program, all word counts are expressed as a percentage of the total number of the words (and thus controlling for the length of the writing sample). Therefore, the length of the testimonies did not need to be corrected.

The observation that more affective and cognitive process words were used during interviews by civil party lawyers than during interviews by judges and prosecutors suggests that witnesses may be affectively and cognitively more activated during the interview with their own lawyers. Pham, Vinck, Balthazard, Strasser, and Om (2011) interviewed all of the Cambodia-resident civil parties (75 of the total 90) participating in Trial 1, and reported that 71% of them felt respected by their lawyer, and 15 of the 17 who testified said that their lawyer had helped them to prepare. Their higher emotional and cognitive engagement might be a result of a more trusting relationship between witnesses and these lawyers. Witnesses may therefore impart more personal information, draw more attention to themselves and their emotions and immerse themselves more fully in their trauma, which is associated with higher perceptual feelings (reflected in the higher use of feeling words). When the memory of a

negative emotional episode is accessed, the physiological, sensory, and experiential components of the corresponding emotions also are activated (Bower, 1981; Lang, 1983; Leventhal, 1984). Research into the recall of traumatic experiences shows a greater use of sensory words in more traumatic sections of trauma narratives (Hellawell & Brewin 2004) and that trauma narratives contain greater somatosensory detail than comparison narratives (Beaudreau, 2007). Furthermore, Holmes et al. (2007) found that using more emotion words to describe experienced traumatic events is significantly associated with increased perceptual feelings. In addition, the stronger processing of emotions is associated with a greater cognitive processing of the traumatic experiences. Boals and Klein (2005) assume that the use of cognitive words reflect an active search for meaning and understanding of a traumatic event and that especially the employment of causal words may be seen as a measure of the extent to which an individual is going through the process of organizing his or her thoughts about an event and attempting to create causal connections. The higher cognitive, emotional, as well as perceptual activation during the interview by civil party lawyers may reflect a better ability or greater willingness to engage in the processing and reactivating of the trauma in this interview situation.

Using more cognitive process words during the interview by defence lawyers than during interview by judges, on the other hand, may reflect a higher cognitive activation due to a more interrogative question style by the defence lawyers who attempts to undermine the credibility of the witness. Defence lawyers confront witnesses with possible contradictions. A high cognitive load is required to maintain a report against accusations of not telling the truth and witness are forced to create causal explanations to organize their testimonies. Due to the confrontation with presumed inconsistencies, witnesses have to differentiate between multiple competing solutions – staying with or changing their prior statements. Defense lawyer consultation of facts of witnesses' traumatic experiences might be compared with exposure to trauma-related stimuli. It may be concluded that during interviews by defence lawyers, witnesses are confronted to a higher degree with trauma-related stimuli than when interviewed by judges, and therefore also are more intensely engaged with their traumatic memories. This process is again associated with a stronger affective engagement. Therefore, contrary to our expectation, experienced stress due to a credibility challenging interview style by defence lawyers does not seem to distance from personal trauma.

When answering questions of female interviewers, witnesses used more cognitive process words, in line with research showing a female speech style where more cognitive process words are used (Newman et al., 2008). This may have primed witnesses to also respond with more cognitive process words (Niederhoffer & Pennebaker, 2002). Contrary to our expectation, witnesses did not use more affective and perceptual process words when answering questions to female interviewers. Furthermore, women refer more to psychological aspects (Newman et al., 2008) of experienced traumatic events. The female law personnel may have asked more personal questions, questions about emotional state, personal experiences, social environments of witnesses, and loss of family members. These possibilities constitute an empirical question, suggesting further directions for investigation. The larger registration of cognitive process words in testimonies obtained by female interviewers may also be interpreted as reflecting an active search for meaning and understanding of the traumatic experiences under the guidance of a female interviewer.

Witness testimonies were composed of significantly more verbal expressions of affective and perceptual processes when interviewed by international parties to the proceedings. Knowing the origins of these differences is speculative, because Cambodian and international interviewers differ in so many aspects. Nevertheless, personal feelings are generally considered a highly private matter in Cambodia and cultural rules governing behaviour prohibit the open expression of strong affect (Cheung, 1993). Cambodian legal professionals may refrain from asking about emotions and affective states and avoid emotional process words, whereas international law personnel would not. This could be the reason why witnesses verbally express more affective processes, namely positive emotions and anxiety, when interviewed by international law personnel. Again, a linguistic style matching in the interviews has to be considered. However, it is important to stress that cultural differences in interview can lead to large discrepancies in witnesses' manner of speech and demeanour. Combs (2010) claimed that this is one of the reasons why international criminal trials confront severe impediments to accurate fact-finding. She reviewed transcripts from three different international criminal courts and concluded that much eyewitness testimony was of highly questionable reliability due to different languages and to different cultural norms of witnesses and fact finders.

This work is, to our knowledge, the first field study that analyzes differences in witness account from a linguistic perspective with a well validated text analysis

program (Pennebaker, Booth, & Francis, 2007). The psychological study of language use has recently received intensified attention in research (Pennebaker, Mehl, & Niederhoffer, 2003). Word-count-based text analysis approaches have been shown to reliably detect meaning in a wide variety of experimental settings, including showing attentional focus, emotionality, social relationships, thinking styles, and individual differences (Tausczik & Pennebaker, 2010). Given that inconsistency in witness disclosure has implications for credibility (Berman et al., 1995; Herlihy & Turner, 2009), variability in witness accounts due to question style, and social, and psychological attributes of the interviewers, was examined in the present study. Although witnesses are often the only available sources of information about their experiences, only little attention has been paid to variability in witness accounts in relation to different interviewers so far. The present results are consistent with the conclusion that linguistic analysis of testimony in concert with understanding its context represents a new direction of research in the field of psychological injury and law. For example, in tort cases, the procedure could be applied to transcripts of interviews by plaintiffs and defence attorneys.

Nevertheless, several limitations to our study should be taken into account. First of all, the Khmer Rouge tribunal is trilingual - originally witness testimonies were given in Khmer, then simultaneously translated into English, and then from English into French. For reasons of consistent evaluation, the English translations of Khmer testimonies were the foundation of the analysis. Due to the translation process from Khmer into English, a loss of information can be assumed. Although the ECCC employed 40 persons in the interpreter and translation pool, complaints about interpretation have surfaced. Translations were not validated in that, for example, a back-translation method was not used. Therefore, all witness accounts should have also been analyzed in their native language, but no Khmer-LIWC dictionary exists so far. In terms of the ecological validity of the study, multilingual international tribunals are the reality and the translation issue often places foreign judicial staff at a disadvantage to their national counterparts. Hence, analyzing translated witness testimonies deals with the fact that not every interviewer benefits from the advantages of the original answers given in the witness mother tongue. Nonetheless, because of the translation issue, the linguistic dimension of the LIWC2007 (e.g., percentage of words in the text that are pronouns, articles, auxiliary verbs, etc.) had to be neglected. Special characteristics of each language risk passing unnoticed in the translation and differences from the original

can occur. The focus was rather on the content-related LIWC dimensions, which offer insight into crucial emotional, cognitive and perceptual processes of the witnesses.

A second limitation relates to the issue of witness type. At the ECCC, witnesses were called by judges. However, all parties to the proceedings were able to make propositions concerning the selections of witnesses prior to the hearing, with the result that some witnesses would be more damaging, others more supportive to the prosecution. It is thus possible that parties to the proceedings (judges, prosecutors, civil party lawyers, defence lawyers) differed in their attitudes towards each witness. Witnesses therefore may not have been treated equally and interviewers possibly varied their questioning strategies as a function of the assumed sympathies of respective witnesses (see Luchjenbroers, 1997). Concerning witness type it must be stressed that witnesses gave evidence either as fact witnesses or as civil parties. Civil parties were legally represented by their lawyers and thus possibly had a prior relationship with them, whereas fact witnesses did not. These differences were not taken into account in our analyses.

A third limitation of the study is a constraint concerning the method. Because a within-participants design was used as the statistical analysis in this field study, order effects have to be taken into account. The order of interview was determined by the ECCC and did not vary. As a result, these effects could not be equalized across interviews by the principle of counterbalancing (Jackson, 2011). It clearly is a disadvantage of naturalistic observation in a field study in that it is not possible to control for all the variables. A certain degree of confounding of the results has to be taken into account. Finally the small sample size of the study ( $N = 24$ ) was determined by the facts of the court proceedings, and constitutes an additional reason why the current study should be replicated and extended.

To conclude, the main finding of this field study is that the linguistic contents of witness-testimonies differ in relation to different interviewers. Legal professionals differ in various variables such as professional role, gender, and nationality, and this influences the linguistic contents of testimony. However, whether these differences in witness accounts are related to the behaviour, the social and psychological attributes, or the questioning style of the different interviewers remains speculative. In further studies, several steps should be undertaken: first, it would be essential to examine the linguistic patterns of the questions asked by the different parties to the proceedings and to relate the linguistic contents of the witness accounts to the proceeding questions.

Second, part of our aim was to use LIWC technology to analyze a vast variety of witness' accounts in a swift and economic manner. Nevertheless, a qualitative investigation of differences in witness accounts would be useful for future research. Such an investigation would allow for a more complete explanation of the ways in which question style, behaviour, and social and psychological attributes of the interviewer contribute to differences in witnesses language use and would allow the analysis of categories beyond linguistic processes. Third, the investigation of the perceived credibility of witness accounts during interviews by different legal professionals might be interesting. Our findings of inconsistencies in witness testimonies due to different interviewers could then be linked with changes in perceived credibility and the notion of a strong relationship between inconsistency in witness account and witness credibility could be further clarified.

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